

GLOSSARY OF SYMBOLS: (Symbols and descriptions)



Alternating Current

RPM

Revolution per minute



Protective Earth Ground



Direct Current



On (Power connection to the mains)



Off (power disconnection from the mains)

IPX1

Protected from dripping water



Fuse



Attention, Consult Accompanying Document



Always Keep on Dry Place



Fragile



This Side Up



Foot Control Mode



Hand Control Mode



Forward/Reverse

REPAIRS OR SERVICE:

Please be sure to properly box and insure your package. If uncertain of the part(s)/component(s) needing service, it is best to send everything. Place your name, address, phone number and/or fax along with a note describing the nature of the problem inside the box. All warranty claims must have a warranty card on file or be accompanied by a copy of your purchase invoice. All packages are to be sent pre-paid, including duties and taxes if applicable.

WARRANTY:

CONTROL BOX & FOOT CONTROL - 1 YEAR; HANDPIECE (MOTOR) - 6 MONTHS
DOES NOT INCLUDE MISUSE OR NORMAL WEAR OF BEARINGS OR CARBON BRUSHES.



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MICROTORQUE II



INSTRUCTION MANUAL

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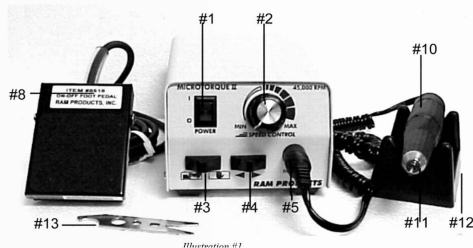
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MICROTORQUE II



1. Power switch
2. Speed control dial
3. Hand/Foot slide switch
4. Forward/Reverse slide switch
5. Handpiece cord connector
6. Foot switch cord connector (see Illus. #3)
7. Power plug socket (see Illus. #3)
8. Foot pedal (on/off) if equipped
9. Variable foot pedal (see Illus. #4) if equipped
10. Handpiece (micromotor)
11. Collet
12. Rubber stand (handpiece rest)
13. Wrench tool

ASSEMBLY

ASSEMBLY

1. Handpiece (#10) cord plugs into the lower right socket (#5), marked motor on the control box.
2. Foot pedal (#8) plugs into the back lower left socket, (#6) marked foot switch on the control box. Please see rear or Illustration #3.
3. Plug the power cord to an electrical outlet. Make sure that the outlet is properly grounded and compatible to the voltage input requirement: 110 Vac only for Microtorque II Item #120A and 230 Vac only for Microtorque II Item #120AE. Look underneath the control box for proper voltage rating.

NOTE: Please check the power switch. It must be in "off" position before plugging the power cord to an electrical outlet. The speed control must be set to minimum.

4. Turn the power switch (#1) to "on" position. The green light should glow.
5. The handpiece is now ready for operation.
 - a. HAND MODE - (#3 switched to the right), the speed of the motor is set with the control knob by turning it clockwise.
 - b. FOOT CONTROL MODE - (#3 switched to the left)
 1. With the on/off foot pedal (Item #8518), step on the foot pedal and gradually turn the speed control knob clockwise until the desired speed is attained.
 2. With the variable foot pedal (Item #8519C or 8519D), gradually step on the pedal until the desired speed is attained.

WARNING: The handpiece should always be on the rubber stand when not in use to avoid dropping or rolling of the handpiece. Permanent damage may occur to the handpiece.

CONTROLS AND OPERATION

I. Microtorque II

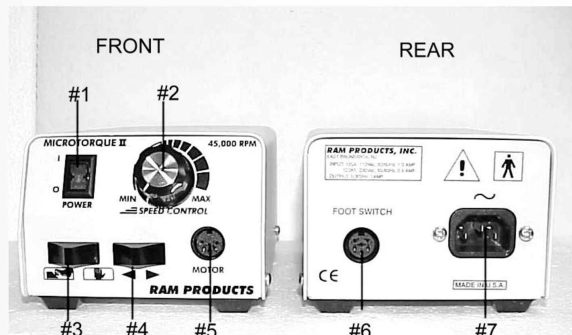


Illustration #2

Illustration #3

1. **POWER SWITCH. (#1)** It is located in the upper left from panel of the control box. It turns the control box on and off. Switch should be in the "off" position when not in use.

2. **SPEED CONTROL DIAL, 0-45,000 RPM's. (#2)** When using the control box in the hand mode turn dial clockwise to increase speed and counterclockwise to reduce speed. Dial should be turned fully counterclockwise to the minimum position when not in use or before turning if off.

3. **FOOT/HAND SLIDE SWITCH. (#3)** The lower left switch on the control box can be set for either hand or foot pedal use. When set in the hand position the speed is completely controlled by the speed dial knob. When set in the foot pedal mode the speed is controlled by the setting of the knob when using the on/off pedal and the speed is completely variable when using the variable foot pedal.

CONTROLS AND OPERATION

4. **FORWARD-REVERSE SWITCH. (#4)** The forward/reverse switch is located in the lower front center of the control box. When the switch is set to the right, the handpiece operates in the forward (clockwise) direction. When the switch is set to the left, the handpiece operates in the reverse (counterclockwise) direction.

5. **HANDPIECE CORD OUTLET. (#5)** The handpiece plugs in here.

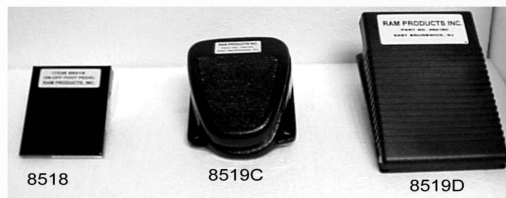
6. **FOOT SWITCH CONTROL OUTLET. (#6)** The foot pedal cord plugs in here, either the on/off or variable speed foot controller.

7. **POWER PLUG SOCKET. (#7)** The power cord is plugged here.

Warning: The control box is designed for one Input AC voltage only. Make sure that the available electrical power is compatible with the voltage input requirement of the control box. (Refer to Assembly, #3)

MICROTORQUE 45,000 RPM SPECIFICATIONS:

Model 12045	Model 12045E	Weight: 3.75 lbs. (1.70kg)
Input: 110V, 50/60Hz;	Input: 230V, 50/60 Hz	Operating Speed Range: 0-45,000RPM
Output: 0-32Vdc;	Output: 0-32Vdc	Length: 7.0" X Width: 4.5" X Height: 3.5"
Fuse: 1AMP	Fuse: .5 AMP	L: 177.8mm x W: 114.5mm x H:80.0mm



II. Foot Controllers

8. **ON/OFF PEDAL (Part #8518).** The on/off foot pedal sends power to the handpiece. The speed of the handpiece is controlled by the control dial (#2) of the control box.

CONTROLS AND OPERATION

9. VARIABLE SPEED FOOT PEDAL (Part 8519C or 8519D). Controls the speed of the handpiece. Unit is designed to override the setting on the speed control dial

- Item #8519C is a transistorized variable control. Its superior designed electronic trigger switch, controlled by a miniature PC board provides smooth and easy speed variation. Foot pedal is made of metal.
- Item #8519D is a transistorized variable control. Its superior designed electronic trigger switch, controlled by a miniature PC board provides smooth and easy speed variation. It has a plastic housing with a metal base.

NOTE: The foot controllers are classified as drip proof (IPX1).
Warning: The foot controller is not to be used in operating rooms and on any other product.

III. Handpiece



HANDPIECE SPECIFICATIONS FOR 45,000 HP ITEM #45000

DC 32 Volts/1 AMP (Maximum 1.5 AMP)

Weight: 9.76oz; Length: 6"; Diameter: 1.1"

Weight: 272.1 grams; Length: 152.4mm; Diameter: 27.9mm

10. COLLET RELEASE. (#10) Turn in clockwise direction towards "R" arrow to release the bur from the collet. Turn counter clockwise direction towards "S" arrow to secure bur in collet. (See Illustration #6)

11. COLLET. (#11) Insert bur, brush, mandrel etc. into the collet. Replacement collets are available in either 3/32", and optional 3mm or 1/8".

12. HANDPIECE REST. (#12) Holds handpiece when not in use. It is recommended to keep handpiece in handpiece rest away from the control box to avoid demagnetizing the motor.



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CONTROLS AND OPERATION

13. WRENCH TOOL. (#13) Used to change or replace collets.

NOTE:

- It is normal for the handpiece to warm up slightly on continued use.
- Do not expose to water or use in wet locations.

WARNING:

NEVER TURN SET RING
WHILE MOTOR IS ROTATING.
PERMANENT DAMAGE TO THE
MOTOR IS POSSIBLE.

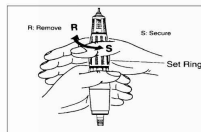


Illustration #6

45,000 HP ITEM #45000 INSTRUCTIONS FOR CHANGING BRUSHES

(Please refer to Assembly/Disassembly)

The brushes are located in the back of the handpiece, in the section closest to the power cord.

- With an Allen wrench, unscrew the set screw for strain relief (910-46).
- With a philips screw, unscrew the two endcap screws (910-45).
- Gently pull the endcap (910-44) away from the end of the handpiece.
- The white plastic retainer for fan should show with the tip of brushes (910-39) on both sides where the ends of the handpiece cord are soldered. Detach the wires with the soldering iron.
- Pull out the plastic retainer for fan (910-43) and with the use of an allen wrench, unscrew the pair of set screws (910-42) for fan. The rear motor fan will now be pulled out.
- With a philips head screw driver, unscrew the carbon brushes screw (910-40).
- Gently pull out both the old 45,000 RPM handpiece brushes and replace with a new pair.
- Assemble the parts by following the disassembly in reverse order.
- New brushes may take several hours during the breaking period where the handpiece may run slightly warmer than usual.

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INSTRUCTIONS FOR HP

INSTRUCTIONS FOR CHANGING COLLET

1. Lock blank mandrel or any proper sized bur in collet.
2. Using spanner hook end of chuck wrench, turning counter clockwise, remove chrome nose tip part #910-1 from handpiece.
3. Hold blank mandrel with fingers and pull spindle assembly out of handpiece. If necessary, use a pair of small smooth jaw pliers and grip only by the bur portion.
4. Insert and seat collet end of spindle into triangle opening in chuck wrench. Using a #1 Phillips screwdriver unscrew (turn counterclockwise) delrin (white plastic, part #910-17) joint from spindle. Chuck wrench may be secured in a bench vise if desired.
5. Hold blank mandrel and collet with fingers and pull collet out of spindle assembly.
6. Insert new collet with mandrel into the front of the spindle assembly. Thread delrin joint part #910-17 from rear with fingers while applying slight inward pressure. Using chuck wrench and Phillips screwdriver secure delrin until tight, but do not over tighten.
7. Insert spindle assembly into handpiece. Be sure spindle is properly seated. Replace dust seal (part #910-2).
8. Screw chrome nose tip part #910-1 onto handpiece and tighten with chuck wrench.
9. Check to see chuck release mechanism is functioning properly. Check to see burs are properly secured.
10. Handpiece is now ready to use.

MAINTENANCE

SUGGESTED MAINTENANCE

1. Carbon brushes in handpiece motor are designed for long life (approximately 1,000 hours). Carbon brushes should be replaced periodically (approximately 1 year). Replacement part #910-39.
2. Keep clean from dust and grindings as best as possible.
3. Wipe handpiece only with isopropyl alcohol and avoid getting inside wet. It is normal for the handpiece to feel slightly warm after continued use. Use standard ISO burs, 3/32" (2.35MM). Avoid using rusty or eccentric burs as this will cause excess wear on the bearings. Follow safety speeds and precautions recommended by the bur manufacturer. Always wear a dust mask, eye protection, and use adequate suction or ventilation.
4. Do not drop the handpiece at any time as this may cause damage to the bearings. In the event the handpiece is dropped, please check that the bur is not bent and resume use carefully, checking for excess noise or heat. If any damage, please return to manufacturer for service.

PRECAUTIONS

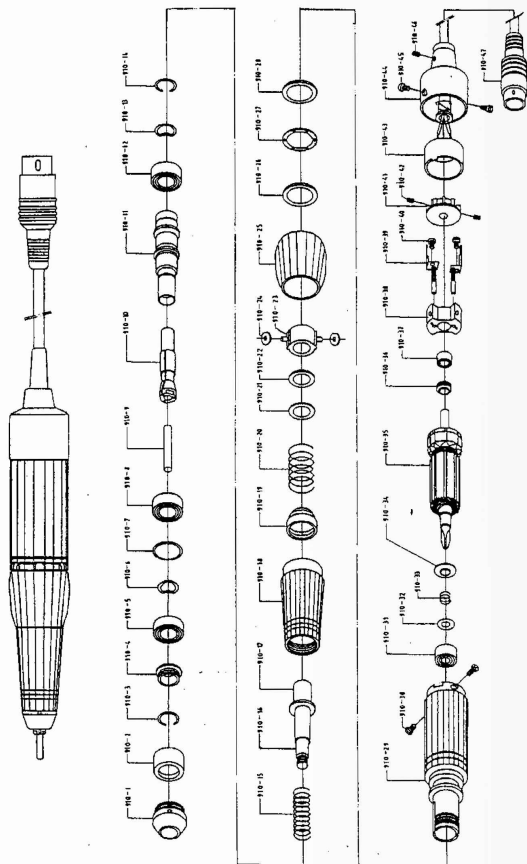
1. When using electric tools, use basic safety precautions in order to reduce risk of fire, electric shock, and personal injury.
2. Do not expose electric tools to water, or use in damp or wet locations.
3. Do not wear loose clothing or jewelry as they can be caught in the drill.
4. Do not attempt to service or repair handpiece, control box, or foot control, or warranty is void.
5. Do not oil, lubricate, or grease the handpiece (This will only lead to further damage of the greased sealed bearings).
6. Do not attempt to open collet (release bur) while handpiece is running.
7. Do not switch forward or reverse direction until motor has completely stopped.
8. Do not sterilize or autoclave. Do not get handpiece wet (except for the front-end attachments with the "E"-type motor).
9. When machine is not in use, power switch should be turned off.
10. Do not run handpiece without a bur properly locked in place.

PARTS LIST FOR 45,000 RPM HANDPIECE

RAM ITEM #	PART #	DESCRIPTION
910-1	910-1	Nose Tip
910-2	910-2	Dust Seal A
910-3	910-3	Front C-Clip
910-4	910-4	Dust Seal B
910-5	910-5	1280ZZ Ball Bearing
910-6	910-6	Large Wave Washer
910-7	910-7	Bearing Spacer
910-8	910-8	1280ZZ Ball Bearing
910-9	910-9	Black Mandrell
910-10	910-10	Chuck 3/32" 2.35MM Std
910-10A	910-10A	Chuck 3MM
910-10B	910-10B	Chuck 1/8" 3.17MM
910-11	910-11	Chuck Case
910-12	910-12	1280ZZ Ball Bearing
910-13	910-13	Small Wave Washer
910-14	910-14	Rear C-Clip
910-15	910-15	Chuck Spring
910-16	910-16	Chuck Joint
910-17	910-17	Delrin Joint
910-18	910-18	Brass Sheath w/Plastic Cover
910-19	910-19	Spring Cover
910-20	910-20	Coil Spring
910-21	910-21	Flat Washer
910-22	910-22	Flat Washer
910-23	910-23	Roller Ring
910-24	910-24	Rollers For Roller Ring
910-25	910-25	Set Ring
910-26	910-26	Thrust Ring
910-27	910-27	Thrust Bearing
910-28	910-28	Thrust Ring
910-29	910-29	Motor Case w/ Magnet
910-29A	910-29A	Plastic Cover for Motor Case
910-30	910-30	Motor Screw
910-31	910-31	1040ZZ Ball Bearing
910-32	910-32	Bearing Shield
910-33	910-33	Spring for Bearing Fitting
910-34	910-34	Armature Spacer - A
910-35	910-35	Armature Assembly
910-36	910-36	Armature Spacer - B
910-37	910-37	730ZZ Motor Baring
910-38	910-38	Plastic Housing-Brush Holder
910-39	910-39	45000RPM HP Brushes, Pair
910-40	910-40	Carbon Brush Screws
910-41	910-41	Rear Motor Fan
910-42	910-42	Set Screw for Motor Fan
910-43	910-43	Plastic Retainer for Fan
910-44	910-44	End-cap for HP
910-45	910-45	Screw for End Cap
910-46	910-46	Set Screw for Strain Relief
910-47	910-47	Cord Assembly
910-47A	910-47A	Strain Relief for Cord Assembly

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45,000 RPM HANDPIECE (ITEM #45000)



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